MULTIMEDIA UNIVERSITY

STUDENT IDENTIFICATION NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2016/2017

BIC1024 – BUSINESS APPLICATIONS DEVELOPMENT

(All sections / Groups)

11 MARCH 2017
2.30 p.m – 4.30 p.m
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This Question paper consists of 7 pages with 7 Questions only.
2. Attempt **FOUR** out of SIX questions in Part A. Attempt **ALL** questions in Part B. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

PART A: Answer FOUR questions only. (20 marks each question)

QUESTION 1

i. Some daily issues and problems may be solved and encountered with algorithmic solutions. Define algorithmic solution and provide one daily problem that can be solved by employing algorithmic solution. (5 marks)

ii. You are given a task by your superior to assist the customer service department to develop a system that determines the amount of gift voucher to be awarded to customers based on customers' total purchases of a month after excluding the 6% good and sales tax (GST). The system will have to begin by calculating the total sales that exclude GST, and then determine the amount of gift vouchers to be awarded. The total sale excluding GST will be calculate as follows:

Total sales (excluding GST) = Total sales (including GST) / 1.06

The rules and terms in awarding the amount of gift voucher is as follow:

- Gift voucher amount of RM20.00 will be awarded if total monthly purchase excluding GST is more than RM1000.00.
- Gift voucher amount of RM10.00 will be awarded if total monthly purchase excluding GST is more than RM500.00.
- Gift voucher amount of RM5.00 will be awarded if total monthly purchase excluding GST is more than RM250.00.
- No gift voucher to be awarded if total monthly purchase excluding GST is less than or equal to RM250.00.

Before coding the program, prepare a problem analysis chart that represent the required system. (10 marks)

iii. Among the organisational tools that will assist in problem solving using computer is interactivity chart. Briefly explain the purpose of using interactivity chart in problem solving using computer. (5 marks)

(Total: 20 marks)

Continued...

QUESTION 2

i. Computer needs variables to solve problems. Define variables in computer programming. State a suitable moment to use variables during business application development for problem solving. (4 marks)

ii. Given the values A = 6, B = 5, C = 4, and D = 3, evaluate the following equations:
   a. Z = A – B \ C – D ^ 2 (2 marks)
   b. Z = 2 * (A * B) MOD 2 + D * C (2 marks)
   c. Z = B > A AND C > D (2 marks)
   d. Z = A < D OR NOT(B > C) (2 marks)
   e. Z = NOT (A > D) (2 marks)

iii. Describe the concept of coupling in computer programming. Explain the reason behind the desirability of implementing low coupling during program development. (6 marks)

(Total: 20 marks)

QUESTION 3

i. The following portion of program is written by using C language.

```
int n = 100;

while(n>80)
{
    printf(" %d\n", n);

    n = n -3;
}
```

   a. Illustrate the output of the code shown above. (5 marks)

   b. Using C Language, rewrite the program above by using *for* structure. (5 marks)

ii. Briefly discuss the use of decision table and its roles in program development. (6 marks)

iii. Briefly describe the suitable moment to use sequential logic structure when developing a solution for a problem. (4 marks)

(Total: 20 marks)

Continued...

QUESTION 4

Your team are to assist the company human resource manager to develop a system that determined the percentage of salary increment based on employee's performance rating. The manager has requested that once performance rating is entered, the system will set the percentage of salary increment based on the following:

Performance rating	Increment (%)
0 – 1.9	0
2.0 – 2.5	3%
2.6 – 3.0	5%

The manager also requested that the system to display "Error" if the user of the system enters an invalid rating. You are assigned to design and develop the portion of the program that made decision in displaying the percentage of salary increment based on the performance rating. A modular structured programming approach will be deployed.
You decided to use positive logic decision structure to create the programs.

i. Before coding the program, draw a flowchart that depict the above scenario. Name this module as "Decision". (10 marks)

ii. By using C language, write the codes that represent the flowchart drawn in (i). Assume all variables has been declared and are set as global variables. (10 marks)

(Total: 20 marks)

Continued...

QUESTION 5

The following shows two arrays of data that store the name and age of the starting line-up players of a football team.

Name	John	Ali	Muthu	Chang	Kent	Wally	Bruce	Bane	Steve	Tony	Barry
Age	24	22	19	26	30	23	28	33	29	17	25

Perform the following tasks by using C language.

i. Declare 2 arrays with proper data type and named it as "Name" and "Age" to store the name and ager respectively. (6 marks)

ii. Display the fifth element of "Name" array. (2 marks)

iii. It seems Wally sustains a serious injury that will rule him out of the season. The manager will decide a player to replace him later. Create codes that allow the manager to enter the new player's name and age to replace Wally after he has make a decision of this. (4 marks)

iv. There is an error in the age of Chang in the array. Chang is actually 27 year olds this year. Write a code to update Chang's age in the array. (2 marks)

v. Using a loop structure, write codes that display all players' names and their respective ages. (6 marks)

(Total: 20 marks)

QUESTION 6

i. Given the following unsorted numbers below, provide the steps and descriptions in performing bubble sort to sort these numbers in ascending order. (10 marks)

15	12	21	10	19

ii. Explain Repeat/until loop structure and state the suitable moment to use this loop structure during program development. Illustrate a flowchart to represent a Repeat/until loop structure. (10 marks)

(Total: 20 marks)

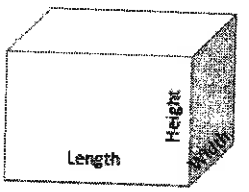
Continued...

PART B: Answer ALL questions. (20 marks)

QUESTION 7

A pet shop is planning to launch a promotion campaign to clear its old rectangular fish tanks with various sizes. These tanks have been piling up the warehouse and the company is planning to let it go on certain percentage of discount. Due to various sizes, the company decided to determine the discount percentage based on the volume of the tanks. The conditions to determine the discount is as follows:

Volume (centimeter^3)	Discount
More than or equal to 100000	20%
More than or equal to 50000	10%
0 to 49999	5%



The volume of rectangular fish tank can be calculated by using the following formula:

```
Volume = Length * Width * Height
```

The company is seeking your help to develop a program that determine the discount of the tank. The system will begins by requesting user to enter the length, width, and height (in centimeter) of the tank to calculate the volume. With the volume, the system will decide the discount to be given.

A portion of programming codes written by using C language (on the following pages) of this program has been handed over to you to continue its development. The program is written by using modular structure approach. Attempt and complete the following tasks.

i. Based on the programming codes, state one local variable and one global variable. (2 marks)

ii. What does the following function prototype means? (2 marks)

```
void print_result (int, float);
```

iii. It seems that *calculate_discount*() is missing from the codes. This module will determines the discount based on the volume of the tank as shows in the table above. Complete this module by using nested *if...else* structure. (10 marks)

iv. Illustrate an interactivity chart to represent this business application. (6 marks)

(Total: 20 marks)

Continued...

Programming Codes:

```
#include<stdio.h>

void input(void);
int calculate_volume(void);
float calculate_discount(int);
void print_result(int, float);
void title(void);

int height;
int width;
int length;

main()
{

    int volume;
    float discount;

    input();
    volume = calculate_volume();
    discount = calculate_discount(volume);

    print_result(volume, discount);

    return 0;
}

void input(void)
{
    title();

    printf("Enter height (cm):");
    scanf(" %d", &height);

    printf("Enter width (cm):");
    scanf(" %d", &width);

    printf("Enter depth (cm):");
    scanf(" %d", &length);

    return;
}
```

Continued...

Programming Codes: (Continued…)

```
int calculate_volume(void)
{
    int m_volume;

    m_volume = height * width * length;

    return m_volume;
}
void print_result(int m3_volume, float m_discount)
{
    title();

    printf("Volume of the tank: %d \n", m3_volume);
    printf("Discount: %.2f%%. \n", m_discount*100);

    return;
}

void title(void)
{
    printf("---------------------------\n");
    printf("\tBIC Pet shop\n");
    printf("---------------------------\n");
}
```

End of Paper